

REMARKS

Entry of this amendment and reconsideration of this application, as amended, are respectfully requested.

Claim 56 rejected under 35 U.S.C. §103(a) over Meagher. Applicants respectfully traverse. Claims 35-54 were rejected under 35 U.S.C. §103(a) over the combination of Meagher and Ishii. Applicants respectfully traverse.

An advantage and starting point for this invention is a zinc phosphating process that is free or nearly free from nitrate and nitrite to improve the waste water quality and high costs.

Meagher discloses compositions that always include cobalt, which is not a requirement of the present claims.

Meagher discloses phosphating on the base of ZnCoNi to form protective coatings on metal surfaces (par. [0007]), but does not teach to use it for a coldforming process as primarily intended in the present application. Coldforming is typically only used for steel parts, not for zinc or zinc-coated steel or Al.

Furthermore, salt spray testing will not be performed for pure coldforming application, note [0069] and other paragraphs. Clearly, Meagher does not contemplate a cold forming process as claimed.

Therefore, there is no teaching for any coldforming steps in Meagher, nor of a solution suitable for coating a metal to be cold formed. Thus, Meagher does not teach the specific claimed ranges.

The main object of Meagher seems to be the possibility to exchange poisonous nickel with cobalt, which has similar properties like nickel, but which is preferred in the art being considered less toxic.

Ishii concerns liquid zinc phosphate conversion coating baths showing a content of an organic peroxide and processes for a low temperature phosphating (25 to 50 °C is very low) to gain very small zinc phosphate crystals in the phosphate coating. According to par. [0001], these coatings shall help to improve the paint adhesion, which is not needed for coldforming, as the phosphate coatings for coldforming are typically partially or totally removed during the forming process and are typically totally removed immediately afterwards. The sentence bridging cols. 2 and 3 indicates the interest in corrosion resistance and paint adherence as well. Generally, the finer the crystals are, the better the paint adhesion. The addition of an organic peroxide is used as normal hydrogen peroxide is quickly decomposed and there is typically a high consumption of H₂O₂ in such a bath (col. 2, l. 10/11). The use of an activator bath e.g. on the base of titanium phosphate colloid (col. 3, l. 46ff) is typically used, especially if there is the need for an phosphate coating especially for long-term corrosion resistant use.

Ishii mentions coldforming starting col. 7, l. 2. The present application, however, concerns in detail only zinc phosphating processes for coldforming, whereas the cited references relate to processes to primarily achieve long-term corrosion resistant coatings which are typically much thinner than the coatings for coldforming. Therefore, there are other parameters stressed and different optimization is required, which are difficult to compare with the present application.

In the specification at pages 21-22, benefits of the process and solutions of the invention are disclosed as follows (underline added):

It was surprising that it was possible to establish an extremely fine-grained phosphate layer by the addition of nitroguanidine. It was moreover surprising that it was possible to reduce the ratio of pickling erosion on the metallic surface to the layer weight of the phosphate layer to

values down to about 47%, which were otherwise of the order of about 80% or even of about 110% and cause a correspondingly higher consumption of phosphate solution. It was possible by this means to reduce the consumption by a factor of up to about 3. It was furthermore surprising that by the addition of nitroguanidine in the presence of alkaline earth metal ions, in some cases a sludge which is significantly better to handle was formed. The addition of nitroguanidine here surprisingly eliminated the adverse effects of chloride, which occur in some cases, of possibly increasing the pickling attack and therefore increasing the sludge content and the consumption. Surprisingly, it was possible for the amount of sludge formed to be decreased to values of 10 to 50 wt.% of other phosphating processes according to the prior art which are employed for cold shaping. It was moreover surprising that it was possible, by the addition of nitroguanidine, to establish a wide operating range for stable phosphating conditions. It was furthermore surprising that by carrying out an activation beforehand, it was in some cases possible to establish certain layer weights of the phosphate layer in a targeted manner.

It seems here to have been possible for the first time to have found a phosphating which can be employed particularly advantageously industrially with only low additions, if at all, of nitrate or/and nitrite, and at the same time renders very small phosphate crystals possible.

Finally, it seems to have been possible for the first time to propose a phosphating which for the first time renders possible only a small amount of precipitated sludge during the formation of closed phosphate layers.

Examples and comparison examples:

Pages 23-30 disclose as follows:

first series of experiments

Without an addition of nitroguanidine the phosphate crystals of the phosphate layer became so large that the shaping properties worsened significantly in comparison with the examples according to the invention. The content of dissolved Fe^{2+} in the phosphating bath, which was approximately zero at the start of the operation, rose here to values of about 1 g/l during more prolonged operation.

Such good phosphating properties and such good layer properties are unknown to the Applicant in phosphating processes according to the prior art for cold shaping, since to the knowledge of the Applicant finely crystalline phosphate layers of far less than 50 μm average phosphate crystal edge length with less than 75% pickling erosion of the layer weight do not belong to the prior art, where e.g. 100 to 120% pickling erosion of the layer weight are usual according to the prior art in chlorate phosphating processes or 75 to 100% pickling erosion in nitrite-containing phosphating processes; the layer weight according to the prior art is conventionally in the range from 4 to 12 g/m^2 here.

It was thus found that the process according to the invention is particularly advantageous, economical and very readily usable industrially, and the process procedure was extremely simple.

Claims 55 and 57 were rejected under 35 U.S.C. §103(a) over Ishii. Applicants respectfully traverse. The deficiencies of Ishii are discussed above, and are applicable here. Thus, this rejection must also be withdrawn.

Claims 35-57 were provisionally rejected for obviousness-type double patenting over claims of copending US application 10/555,929. Applicants will address this issue after an indication of allowable subject matter.

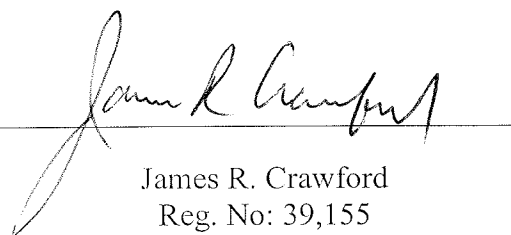
Claims 1 and 17-34 were provisionally rejected for obviousness-type double patenting over co-pending application no. 10/467,850. Applicants respectfully submit that they will address this upon the indication of allowable subject matter.

In view of the foregoing, allowance is respectfully requested.

The Commissioner is hereby authorized to deduct any fee associated with this filing from Deposit Account No. 50-0624.

Respectfully submitted,

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